

Meeting Summary

ETV Source Water Protection Pilot

Infrastructure and Watershed Protection Technologies

Stakeholder Advisory Group

February 6, 2001
Baltimore, Maryland

Tom Stevens, NSF Pilot Manager for the Environmental Technology Verification (ETV) Program's Source Water Protection Pilot, chaired the meeting. Thirty-five persons, including the Stakeholder Advisory Group (SAG) members present, participated in the meeting. A list of the meeting participants is included as [Attachment 1](#). Mr. Stevens read the NSF anti-trust statement and self-introductions were made.

Due to high number of first-time SAG meeting attendees, Penny Hansen, Director of the United States Environmental Protection Agency's (USEPA) ETV Program, presented the background, goals, and principles of the ETV program, which is administered by the USEPA Office of Research and Development. She explained that the five-year pilot phase of the program recently ended. The twelve original pilots will soon be combined into six "centers", one of which will be a water protection center. The Source Water Protection Pilot will be included under the water protection center. It was explained that ETV is not regulatory and it's not an approval process. The purpose of the program is to obtain objective information on environmental technologies to be used in the marketplace. The pilot is operated through public/private partnerships using approved protocols. Stakeholders are important participants during the ETV process. Their role is twofold; they help the pilot to identify and prioritize technology areas and they assist in the identification of verification factors, which are those questions that need to be answered about a given technology during the testing process. The SAG and other stakeholders act as the pilot's surrogate for the marketplace.

Tom Stevens reviewed the goals of the meeting: to update participants on pilot activities (status of protocols and test plans, projections for verification testing), to identify new technology areas for verification, and to obtain ideas for improving Pilot processes.

Tom Stevens reviewed the roles and responsibilities of the SAG. The differences between certification and verification were also reviewed. Both verification and certification use standardized test methods and independent performance evaluations and include formal preparation of the test results. However, differences between the two activities occur in the broad distribution of test reports (verification does, certification does not), having pass/fail criteria (verification does not, certification does), and in policy issues, including auditing of manufacturing facilities, periodic retesting, mandatory review of product changes and use of the NSF Mark (verification does not, certification does).

Tom Stevens explained the nature of the Source Water Protection Pilot's broad scope. Many different technology areas and individual technology types fall under the heading of "Source Water Quality Protection Technologies". The Pilot's original focus was on decentralized systems for wastewater treatment. This later expanded into the three main areas of Decentralized Wastewater Treatment Technologies, Infrastructure Rehabilitation Technologies, and Watershed Protection Technologies. The latter two are addressed by one comprehensive Stakeholder Advisory Group, which is the group meeting today. In the future, a third SAG group may be added to address ship ballast water treatment technologies.

An overview of the status of protocol development and testing of decentralized wastewater treatment technologies and nutrient reduction technologies was provided. The Nutrient Reduction Technologies Protocol has been approved by EPA and is considered final, although it will be reviewed and modified as necessary following the first round of testing. The Decentralized Wastewater Treatment Technologies Protocol is undergoing its final review by EPA prior to being finalized. Nutrient reduction testing will take place at controlled facilities, because controlled dosing is specified by the protocol. Decentralized wastewater treatment testing will focus on commercial/light industrial applications, and test sites will be actual field installations. Food service type treatment systems are of particular interest to the stakeholders. As of this date, twelve (12) decentralized wastewater treatment technology vendors and eight (8) nutrient reduction vendors have applied to participate in the pilot.

An overview of the draft Disinfection Technologies protocol was provided. It was explained that this protocol was the last of the decentralized wastewater treatment technologies protocols to be initiated and it is currently undergoing its first Technology Panel review. There was discussion regarding whether the protocol should be added to those under consideration by the Infrastructure and Watershed Protection SAG and whether the scope of the protocol could be expanded to include systems larger than 10,000 gpd (the current limit). The SAG suggested that NSF first conduct outreach to vendors of disinfection technologies and determine the main audience for the protocol. Depending on vendor response, the protocol could be modified to reflect the market. Several different possibilities for the scope were discussed, including leaving the upper limit as currently written, specifying that the protocol is for small systems, but not defining small systems with a rigid limit, and opening the protocol to all technologies, regardless of their intended applicability. It was recommended that NSF take this issue back to the Technology Panel for their discussion as well. Verification factors for each technology area were discussed.

Verification factors for each technology are determined by answering the question: "What would an engineering consultant, a regulator, or a purchaser of a technology need to know about that technology in order to be confident in recommending, approving, or purchasing it? General verification factors common to decentralized wastewater treatment technologies, as well as other technologies addressed under the ETV Source Water Protection Pilot, are: performance indicators, cost factors (power, chemical, labor requirements), O&M (installation, ease of operation, and evaluation of manuals),

byproducts or residuals produced during the verification test period, and other issues, such as noise or odors.

The process that led to the formation of the two Technology Advisory Groups under the Infrastructure and Watershed Protection area was discussed, and the priority technologies determined by each TAG were listed. Under the Watershed Protection TAG, ship ballast water treatment was defined as the top priority. Other priorities for this TAG include bio-additives to collection systems, modified animal feed, car wash treatment systems, spill containment and control, and membrane liners. For a complete list of technologies prioritized by the Watershed Protection TAG, please refer to a printout of the meeting overheads, Attachment 2.

Rich Everett (U.S. Coast Guard) provided an overview of the Coast Guard's main non-defense operational components: 1) Maritime Mobility and Security: aids to navigation, lighthouse management, search and rescue, and law enforcement and 2) Marine Safety and Environmental Protection. Marine Safety deals with vessel safety inspections, licensing of personnel, and waterways management. The Environmental Protection aspect of the Coast Guard's duties includes pollution prevention (shipboard wastewater treatment and oily water discharge prevention) and the prevention and clean up of oil spills. Congress has also charged the Coast Guard with other environmental responsibilities, including preventing/reducing the introduction of non-indigenous species, also known as aquatic nuisance species (ANS) to U.S. waters. The issue of ANS does not have the same initial, high profile impact on the public as oil spills, etc., but it's becoming a more significant problem over time. In 1990, Congress passed the Non-indigenous Aquatic Nuisance Prevention and Control Act (NANPACA) primarily addressing ANS control in the Great Lakes. Currently, ballast water exchange is the primary method for reducing the rate of ANS introduction. However, the process of ballast water exchange can destabilize a ship, particularly during inclement weather. Some ships are not designed to handle the structural stresses that can occur during ballast water exchange. Because of the risk associated with ballast water exchange during inclement weather, current regulations provide a safety exemption. In the Great Lakes, if a ship is not able to exchange its ballast water, the Coast Guard may put a seal on the ballast water tank to ensure it is not discharged. Ships also have the option of using an approved water treatment technology to treat their ballast water, although these technologies are not readily available at this time. Outside of the Great Lakes, the Coast Guard has established a requirement for reporting ballast water management actions and requests that vessels follow voluntary ballast water management guidelines. In July 2001, the Coast Guard expects to assess the success of compliance with the regulations and guidelines. After one year, only around 25% of vessels are compliant with the reporting requirement, suggesting the need for promulgating mandatory regulations. Ballast water treatment technologies are almost all modifications of existing traditional water treatment technologies. Flow rates during ballast water exchange are very rapid (tons of water per minute), which presents a challenge for treatment processes. Normally, vessels operate for around five (5) years between dry docks, which is when new technologies/parts could be installed.

There are several organizations that are likely to be involved in the evaluation of ballast water treatment technologies. The International Maritime Organization (IMO) exists to negotiate international treaties on vessel safety and environmental requirements, and the Coast Guard plays an active role in these arrangements. To facilitate the development of treatment technology in the U. S., the Coast Guard would like to be involved with the ETV program. USEPA and the Coast Guard held a meeting prior to the SAG meeting and agreed that the reason there are currently no commercial-ready ballast water treatment technologies is because of the lack of regulations and a treatment standard. These two organizations are looking to sign a Memorandum of Understanding to define the role of each organization in their joint activities. If enacted, new regulations and an associated treatment standard for ballast water treatment could speed the development of technologies in this area, and there will then be a need for verification of system capabilities. Final reports for ballast water treatment technologies evaluated under the ETV program will include not only NSF and USEPA signatures/logos, but will also include Coast Guard signatures, etc. It is possible that the existence of regulations for ships entering the Great Lakes may not be sufficient to stimulate development of these technologies, since many foreign vessels may only enter the Great Lakes once during their lifetime.

Tom Stevens explained that the ETV Source Water Protection Pilot is working with a vendor of an in-pipe treatment technology to help determine the appropriate testing approach. The SAG discussed whether it is appropriate and desirable to encourage that vendors propose their own protocols. Many agreed that vendor proposal of a basic protocol would be advantageous to determining the feasibility of verifying a particular technology, although ultimately, the Technology Panel would be responsible for determining this, with or without a draft outline.

Michelle Forcier (NSF) provided an overview of test plan development in the Animal Waste Treatment and Mercury Amalgam Removal areas. Both the test plans for solids separation technologies and the protocol for mercury amalgam removal technologies are nearing completion, with testing to be initiated by summer 2001. For solids separation technologies, testing will take place using swine waste at North Carolina State University and a mass balance approach will be used. Verification factors for solids separation technologies include evaluation of technology effectiveness in separating solids from liquid swine waste, and reducing nutrients, O&M measurements, and cost factors. Some meeting participants suggested it would be helpful to have the technology panel memberships for each technology area posted on the internet, so they could be assured that the appropriate officials and organizations are involved. For mercury amalgam removal technologies, testing will take place at dentist offices and the removal of both soluble and particulate mercury will be measured. This stands in contrast with other currently available protocols, which measure removal of only particulate mercury. Again, as with most technologies evaluated under the ETV Source Water Protection Pilot, O&M measurements, cost factors, and residuals generation will also be verified.

Maren Roush (NSF) provided an overview of protocol development for in-drain treatment technologies, which are technologies used in controlled situations, such as

machine wash down areas in which absorbents are used in floor drains to remove soils, metals, and surfactants. A vendor meeting was held in which four vendors were interested. To date, one vendor has sent an application to NSF. Penny Hansen (USEPA) advised the participants at the meeting that the application period never ends. It was suggested that vendors show an interest in having their technologies verified during the beginning stages of the pilot, so that having multiple vendors use the same test site may reduce test costs. The test period for these technologies is three months. The verification factors for in-drain treatment technologies are similar to the other technology areas: contaminant removal, media absorbency, media capacity, and O&M measures, and will include disposal of the media. The protocol is currently being reviewed by the SAG, and is also available on the NSF and USEPA websites for stakeholder review. It was asked if testing will be performed at a single testing location with multiple vendors. It was explained that multiple vendors at same test site would be ideal from a cost standpoint and that Michigan State University and the University of Minnesota are possible test sites. The applied vendor is eager to begin testing and it is expected that testing will begin in spring of 2001. A question was asked concerning the cost of testing, which was indicated as being dependent on the parameters for which the technology is tested.

Tom Stevens provided an overview of the activities underway in the Wet Weather Flow (WWF) Pilot, which includes induction mixers, source area treatment technologies, flow meters, vortex separation technologies, models, and U-V disinfection. He suggested that the SWP disinfection protocol will be focusing more on dose delivery than on efficacy with real wastewater, as the dose information will provide engineers with the information needed to design systems. Brant Keller (American Public Works Association) described how the City of Griffin, Georgia is interacting with the WWF Pilot to evaluate storm water treatment technologies, and suggested visiting websites www.GASMA.ORG or www.griffinstorm.com for information/results/design manuals.

Tom Stevens provided a general overview of the Infrastructure Technology areas. He discussed the need for "trenchless" technologies because of the huge cost for open cut repair/replacement in cities, not to mention the problems associated with work on private property. He indicated that corrosion control in collection systems is a key issue, and that reconstruction of aging and deteriorated infrastructure will be a focus in the near future. Mr. Stevens also indicated that pilot work for coatings/liners and grouts is being completed with the University of Houston's CIGMAT program, with Dr. Vipu, while pipe liner materials work is being completed with Dr. Barbero at West Virginia University. Pipe bursting, as with pipe liner materials, is being completed in cooperation with the National Association of Sewer Service Companies (NASSCO) and the Pipe Rehabilitation Council (PRC). Dr. Vipu and Mike Burkhard (NASSCO) were introduced to discuss efforts in each of the technology areas.

Dr. Vipu spoke about the importance of coatings and linings as technologies to address corrosion in sewer systems. He worked with the city of Houston in developing a testing program to evaluate products designed for corrosion protection for underground structures. The first stage of testing is to simulate a full-scale test on underground structures. The second stage is to predict the durability of the coating/lining. Chemical

resistance to corrosive sewer conditions is predicted using a holiday test, a bonding test, and a hydrostatic test. The vendors are responsible for applying the coating. Pinholes are made in the coatings and the coated samples are immersed in an acid solution to accelerate the conditions in a sewer pipe. The full bonding and chemical testing period is one year, but reports will be issued at six months. The laboratory tests include 70 coated/lined concrete and clay brick specimens. A question was asked if vendor information would be public knowledge. Dr. Vipu said that CIGMAT holds company names and private information confidential. Penny Hansen added that under the ETV Program, comparisons of products are not made, but that information on vendors a, b, and c would be given.

Dr. Vipu discussed the importance of grouts and how there may be major problems at pipe joints and at manholes. He explained that CIGMAT developed a protocol to evaluate grouts under a controlled environment. He added that leaks in concrete walls that are cracked could be controlled. CIGMAT has developed a list of criteria for how the testing will be performed based on the grout application.

Mike Burkhard discussed pipe liner and pipe bursting technologies. He stated that a number of trenchless technologies were developed in the United Kingdom. "Fingerprinting" will be completed to clearly identify the material being tested. Fingerprinting will allow the user to know if the material they are using is the same as that verified in the test. Mr. Burkhard explained that testing is expected to include two higher strength PVC's, as well as two medium strength PVC's.

Pipe Bursting technologies were also discussed by Mike Burkhard. He stated that there are three different technologies being used in pipe bursting and that 90 percent of the market uses polyethylene versus steel. In pipe bursting, entrance and exit trenches are dug first, and lateral connections are excavated later. Verification factors include effects of the liner material, longitudinal strain, accurate load prediction, onsite weld verification, grade alignment, affect of bursting operation, joint stabilization, and water tightness of finished product. Jay Shrock is designated to write the test plan for pipe bursting and Louisiana Tech is a possible test site.

Tom Stevens discussed innovative technologies that have expressed interest in being evaluated by the ETV Source Water Protection Pilot and asked for input on how to approach such requests. The SAG was asked for their thoughts on a technology that is claimed to clean digester gas streams, allowing for more efficient digested operations and increased capacity for existing facilities. It was asked whether another ETV pilot would be appropriate to evaluate the technology. Mr. Stevens said no, because it falls within the scope of Infrastructure Rehabilitation and Watershed Protection. One SAG member suggested that the protocol to effectively evaluate such a technology would be exceeding complex and difficult to carry out.

Tom Stevens asked for SAG participation in recommending new technology areas to consider. He explained that technologies must have a positive environmental impact and willing vendors. In addition, there must be an environmental need for the technology and

it must be possible to complete testing during the pilot period. Mr. Stevens asked the group for ideas. Utility location technologies were suggested as a possibility. It was explained that there are 3½ million miles of utilities underground, which include electric cables, gas, phones, collection systems etc. It was pointed out that a lot of damage has been done just by drilling through underground utilities while performing other types of work, and that damage to laterals occurs quite often because they are not normally located prior to drilling. Penny Hansen explained that there is another ETV pilot for advanced monitoring technologies that utility location technologies may fit into. Penny Hansen and Ray Frederick (EPA Pilot Manager for the Source Water Protection Pilot) will meet later to discuss this.

Penny Hansen asked if animal waste issues would extend to poultry and cows, in addition to swine. A discussion followed, in which SAG members agreed that all animal wastes should be addressed since water quality issues arise in all cases. One challenge with waste from the dairy industry is that the low price for milk makes expenditures for solid waste handling difficult for farmers. It was also pointed out that focus on animal wastes is likely to continue, with increasing interest in phosphorus, as well as nitrogen. Another SAG member explained an alternate management practice for animal waste, dedicating easements along waterways to provide a buffer for nutrient control. Other practices may need to be included in the ETV program in the future.

Tom Stevens discussed SAG involvement and asked for the SAG members' level of interest in using email as a form of communication. One participant suggested reducing the amount of material that is sent out, and in the future, to distribute only the experimental design portion of the protocol or test plan (excluding sections describing the roles of participants in the ETV process, standard QA/QC requirements, etc.). Further, if NSF only needs a comment on one issue, this should be explained at the beginning of the email. It was also suggested that protocols and test plans be posted on the ETV website with password access, and that SAG members be able to post their comments and review others' on line, since it's likely that the reviewers' would have comments on similar issues.

Penny Hansen indicated that testing under the ETV Pilots will continue in the future. The SWP and Wet Weather Flow Pilots will eventually be combined into a center, as the Drinking Water Systems Pilot has been. This is expected to happen over the next two years. She added that even though there is new administration in Washington, the ETV program is expected to continue.

Tom Stevens discussed the next meeting date, asking the group if they would like to combine the Decentralized Wastewater Treatment SAG meeting with the IWP SAG meeting next time. The SAG was in agreement with this approach, and NSF will be responsible for arranging the next meeting.

Attachment 1—List of Participants

ETV SWP Infrastructure/Watershed Protection Pilot
Stakeholder Advisory Group Meeting Participants
February 6, 2001
Embassy Suites - BWI, Baltimore, MD

Participant	Organization
Leonard Bull *	N.C. State University
Jim Converse *	American Society of Agricultural Engineers
Dave Neiman *	National Rural Water Association
Mike Burkhard *	National Association of Sewer Service Companies
Brant Keller *	American Public Works Association(City of Griffin, GA)
Ray Sterling *	Trenchless Technology Center
Ronald Entringer *	Association of State Drinking Water Administrators (New York State Department of Health)
Rodney Wyatt	State of Delaware DNREC
Dave Schepens	State of Delaware DNREC
Jack Hayes	State of Delaware DNREC
Tony Tafuri *	U.S. EPA - Urban Watershed Management Branch, Edison, NJ
Charles Vanderlyn	U.S. EPA - Municipal Technology Branch, Washington, DC
Heidi Urquhart	National Association of County and City Health Officials
Paula McLelland	Capitol Water Treatment, Inc.
Richard Everett	U.S. Coast Guard, Washington, DC
William Hasselkus	U.S. EPA - Municipal Technology Branch, Washington, DC
Rod Dickerson	In-Pipe Technology Company, LLC
Charles Munson	American Pipe & Plastics, Inc.
Jim Starker	InterGlobal Waste Management
Steve McCorkle	InterGlobal Waste Management
Newton Kerschner	Prince George's County Health Department
Maria Miller	EDI Process
Herman Miller	EDI Process
David Parkhill *	American Society of Civil Engineers (Brown & Root Services)
C. Vipulanandan *	University of Houston
Amit Pramanik	Water Environment Research Foundation
Brian Rohan	Rohan Engineering, PC
Wilder Lucas	E&W Marketing Group, Inc.
Steve Nutt	XCG Consultants Ltd.

Penny Hansen	U.S. EPA ETV Program, Washington, DC
Ray Frederick	U.S. EPA Urban Watershed Management Branch, Edison, NJ
Stephanie Barrett	ICF Consulting
Gordon Bellen	NSF International
Michelle Forcier	NSF International
Maren Roush	NSF International
Tom Stevens	NSF International
